

**Sudan University of Science and Technology**  
**College of Graduate Studies**

**IN CAPTIVITY PERFORMANCE OF GUINEA FOWL**  
**(*Numida meleagris*) FED DIFFERENT LEVELS OF**  
**PROTIEN AND ENERGY**

أداء الدجاج الغبى فى الاسر والمغذى على مستويات مختلفة من  
البروتين والطاقة

**By**

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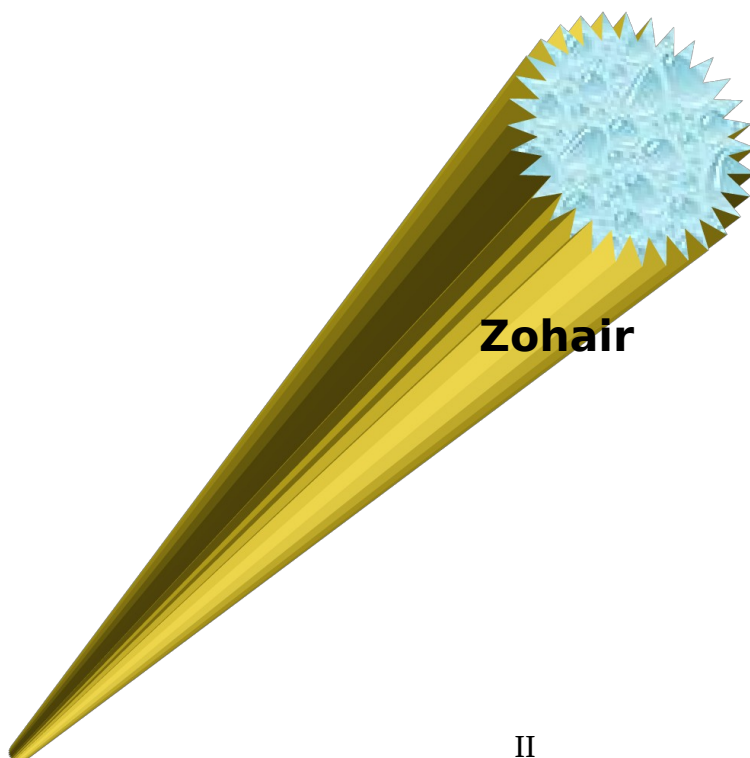
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# Dedication

**To the soul of my father, who  
directed me in the right way  
To my mother, brothers and my  
wife who encouraged me to finish  
this thesis,  
To my beloved sons Magzoub,  
Ahmed and Abd Elrahman .  
To my friends...**



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## **ABSTRACT**



This study was undertaken to assess dietary CP and ME concentrations for optimum growth performance and carcass characteristics of helmeted guinea fowl (*Numidia meleagris*) meat. The nutrition of impact on performance, carcass quality, meat quality attributes, sensory characteristics, and nutritive value of guinea fowl meat was studied.

A total number of 150 day old guinea fowl Keets were randomly assigned to five pens. The five groups were offered starter' mash for adaptation and provided water ad. lib. until 10 days of age. Five Experimental diets were formulated as A(20.5% CP, 2990 kcal ME), B(high protein 26% :high energy 3150 kcal), C (high protein 26%: low energy 2800 kcal), D (low protein 16% :high energy 3150 kcal) and E (low protein 15% :low energy 2750 kcal). Diet A served as the control ration. Feeding extended for 7 weeks during which performance parameters were recorded. At the end of the feeding period, five birds from each group were randomly weighed and slaughtered and carcass and meat quality attributes were assessed.

The final live weight in groups B ( $656.82 \pm 0.01$ ) and C ( $735.11 \pm 0.01$ ) and the weight gain in group B ( $600.98 \pm 0.01$ ) and C ( $678.98 \pm 0.01$ ) were not significantly ( $P > 0.05$ ) higher than the other treatment groups. Feed intake in group D ( $917.47 \pm 0.010$ ) was not significantly lower than the other groups. Feed conversion ratio (FCR) of group D ( $3.035 \pm 0.007$ ) and E ( $3.06 \pm 0.003$ ) were similar. There was no significant difference ( $P > 0.05$ ) no variations in dressing-out percentages between the control ( $72.5 \pm 0.9$ ) and the test groups except for group D ( $69.8 \pm 0.72$ ).

Meat quality parameters of selected cuts were not significantly ( $P>0.05$ ) similar in colour. Water holding capacity of group B ( $1.537\pm1.03$ ) and E ( $2.22\pm0.10$ ) were not significantly ( $P>0.05$ ) different higher than the control and test groups, while water holding capacity of group C ( $0.88\pm0.11$ ) was the lower one ( $P>0.05$ ). Cooking loss in group D ( $22.85\pm3.28$ ) was significantly different ( $P<0.01$ ) higher than the test groups. Shear force in groups D ( $3.009\pm0.1$ ) and E ( $3.57\pm0.32$ ) were not significantly ( $P>0.05$ ) different higher than the control and the test groups.

There were also non-significant ( $P>0.05$ ) differences in the sensory evaluations among the control and test group.

Blood parameters including Hb, PCV, and WBCs counts were also studied in guinea fowl with resultant not significant differences ( $P>0.05$ ) between the groups. The normal values of Alkaline phosphates (ALP), Creatine kinase (CK), Aspartate amino-transaminase (AST), Lactate dehydrogenase (LDH), blood sugars, creatinine, total protein, total albumin, and the minerals sodium, phosphorus, calcium and potassium were determined in the sera of the birds. The changes in these parameters remained within normal ranges and could be considered not significant.

The results of this study indicated that good efficiency gain was observed when feeding guinea fowl concentrate ration with 26% CP and 2800kcal/kg ME. till eight weeks of age

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

" وَلَحْمٍ طَيْرٍ مِمَّا يَشْتَهُونَ " صدق الله العظيم

## ملخص الأطروحة

المعلومات عن مكونات الجسد ونوعية اللحم وخصائصه والقيمة الغذائية للحوم الدجاج الغيذى شحيحة ، لذلك أجريت هذه **لدراسة لتحديد النسبة المئوية للبروتين- لحم والمطلة- للحصول على نمو وصفات جسمائية للحوم الدجاج لغنى بدراسة درجة تأثير التغذية فى نوعية الجسد ، صفات وسمات اللحم ومميزاته الحسية والتذوقية والقيمة الغذائية له .**

تم توزيع عدد 150 صوص من الدجاج الغيذى عمر يوم عشوائيا على **خمس حظائر وتلطف لهم الفلاف لمدة 10 أيام** للتأقلم ومن ثم صممت خمس علائق لتكون العليقة (أ) ( المجموعة المرجعية) ذلت بروتين خام 20.5 % ( ) وطاقة ( kcal 2990 ) والعليقة (ب) بروتين عالى (26 % ) وطاقة عالية ( kcal 3150 ) ، و العليقة (ج) من بروتين عالى (26 %) مع طاقة منخفضة ( kcal 2800 ) و العليقة (د) بروتين منخفض وطاقة عالية ( kcal 3150 ) وأخيرا العليقة (هـ) بروتين منخفض (15 %) وطاقة منخفضة (2,750). تمت التربية فى إضاءة طوال ال 24 ساعة مع توفر العلف والماء على طول اليوم ، إستمر الإعلاف لمدة 7 أسابيع أخذت خلالها قياسات الأداء وذلك لحساب الوزن ، الوزن المكتسب ، العلف المستهلك وكفاءة التحويل الغذائى وبنهاية فترة الإعلاف تم ذبح عدد 5 طيور عشوائيا من كل مجموعة وتم تقييم جسد الذبيح ومناخى جودة اللحم.

كان الوزن النهائى (كجم) فى المجموعة (ب)  $(0.01 \pm 656.82)$  و المجموعة (ج)  $(0.01 \pm 735.11)$  و كسب الوزن فى مجموعتى الاختبار (ب)  $(0.01 \pm 600.98)$  و (ج)  $(0.01 \pm 678.98)$  اعلى من مجموعات الاختبار الاخرى ولم توجد فروق معنوية ( $0.05 > 0$ ). معدل الماكول

فى مجموعة الاختبار (د)  $(0.010+917.47)$  اقل من مجموعات الاختبار الاخرى ولم توجد فروق معنوية ( $0,05 > \alpha$ ).

تشابه معدل التحويل الغذائى فى المجموعة (د)  $(0.007+ 3.035)$  والمجموعة (هـ)  $(0.003+ 3.06)$  ولم توجد فروق معنوية ( $0,05 > \alpha$ ).

نسبة التصافى بين المجموعة المرجعية  $(0.9 \pm 72.5)$  ومجموعات الاختبار الاخرى متشابه وأظهرت فروق غير معنوية ( $0,05 > \alpha$ ) (ماعداء المجموعة (د)  $(0.72 \pm 69.8)$  اقل من المجموعة المرجعية

خصائص لون اللحم فى القطع المختارة متشابه وأظهرت فروق غير معنوية ( $0,05 > \alpha$ ) بينما قدرة امسك الماء فى المجموعة (ب)  $(1.537 \pm 1.03)$  والمجموعة (هـ)  $(0.10 \pm 2.22)$  اعلى من مجموعات الاختبار والمجموعة المرجعية ولم تظهر فروق معنوية ( $0,05 > \alpha$ ) (فى حين أظهرت المجموعة (د)

(  $0.88 \pm 0.11$  ) قدرة امسك قليلة للماء مقارنة مع المجموعة المرجعية ومجموعات الاختبار الاخرى .

فا قد الطهى فى المجموعة (د)  $(3.28 \pm 22.85)$  سجل اعلى نسبة واظهر فروق معنوية ( $0,05 < \alpha$ ) وقوة القطع للمجموعة (د)  $(3.009 \pm 0.1)$  والمجموعة (هـ) اعلى من مجموعات الاختبار والمجموعة المرجعية وأظهرت فروق غير معنوية ( $0,05 > \alpha$ ). لم يكن هنالك إختلاف معنوى

( $0,05 > \alpha$ ) بين المجموعات فى التقييم الانطباعى للحم. دراسة تمت خصائص الدم و لم تكن هناك أى فروقات معنوية ( $0,05 > \alpha$ ) بين الهميوجلوبين والكريات البيضاء والحجم التراكمى للكريات الحمراء. تم أخذ عينات من مصل الدم لتحديد نسبة إنزيم الفوسفات القلوى ، ومحرك الكريتين و نأفى أمينو الاسبارتيت ونازع هيدروجين اللاكتيت، وكذلك تحديد نسبة السكر و الكريتين والبروتين و الألبومين، وأملاح الصوديوم والفسفور والكالسيوم والپوتاسيوم وظلت قيم هذه القيسات فى المعى الطبيعى لها و لم تكن هناك أى فروقات معنوية ( $0,05 > \alpha$ ) .

كشفت نتيجة هذه الدراسة أن أمثل مستوى من البروتين والطاقة لتغذية الدجاج الغني في المناطق المدارية هو نسبة 26% بروتين خام مع 2800 كيلو طاقة وذلك حتى الأسبوع الثامن من العمر.



